

WHAT IS CLAIMED IS:

1. A system for monitoring a space and its contents over a network, comprising:

a microprocessor to provide processing and network
5 connectivity capability;

one or more sensors to detect one or more physical parameters and generate one or more sensor signals representative of the detected physical parameters;

an analog-to-digital converter for converting one
10 or more of the sensor signals to a digital format and to provide one or more corresponding digital signals to the microprocessor;

instructions for processing said sensor signals and corresponding digital signals and generating an
15 alarm signal when any of the one or more physical parameters exceeds a corresponding threshold value;

at least one input/output port for communicating with the network;

one or more memory modules for storing system
20 data;

a network based interface for providing programming instructions to the microprocessor and for receiving monitoring status and alarm information from the system; and

25 a power source to power the system.

2. The system of Claim 1, wherein the network is a global computer network.

3. The system Claim 2, wherein the global computer network is the Internet.

5 4. The system of Claim 1, wherein the network is an intranet.

5. The system of Claim 1, further comprising one or more connectors to interface with external devices.

10 6. The system of Claim 5, wherein the one or more connectors further comprise no more than one of each of an Ethernet connector, a serial connector, a power connector, and a phone line connector.

15 7. The system of Claim 6, wherein the Ethernet connector is an RJ-45 to Cat 5 or Cat 3 wiring connector, and wherein the serial connector is an RJ-11 connector.

20 8. The system of Claim 6, wherein said power source is the excess voltage provided by an Ethernet cable coupled to said Ethernet connector.

25 9. The system of Claim 1, wherein the network connectivity capability is via a telephone line.

30 10. The system of Claim 1, wherein the network connectivity capability is via an Ethernet interface, and wherein said Ethernet interface has compliant TCP/IP stacks.

11. The system of Claim 1, wherein the microprocessor is an embedded Java microprocessor.

5 12. The system of Claim 11, wherein the microprocessor is a tiny internet interface microprocessor.

10 13. The system of Claim 11, wherein the microprocessor operates on an embedded Java software platform.

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15 15. The system of Claim 1, wherein the one or more sensors further comprise no more than one of each of a temperature sensor, a relative humidity sensor, and an air flow sensor.

20 16. The system of Claim 15, wherein the relative humidity sensor further comprises a Figaro Engineering NH-2 humidity sensor, and wherein the air flow sensor further comprises a hot-wire anemometer circuit.

25 17. The system of Claim 1, wherein the one or more physical parameters comprise temperature, relative humidity, and air flow.

18. The system of Claim 1, further comprising one or more indicator lights to indicate one or more system conditions.

5 19. The system of Claim 1 further comprising a radio frequency interface operable to communicate wirelessly with the network or with a device external to the network.

10 20. The system of Claim 1, further comprising instructions for generating and forwarding an email status report to one or more users.

15 21. The system of Claim 20, wherein the status report indicates that one or more of the one or more physical parameters has exceeded said corresponding threshold value.

20 22. The system of Claim 1, further comprising instructions for generating and forwarding an email alarm report to one or more users when any one of the one or more physical parameters exceeds said corresponding threshold value.

25 23. The system of Claim 1, further comprising instructions for generating and forwarding a status report via electronic paging.

30 24. The system of Claim 1, wherein said programming instructions are provided in HTML.

25. The system of Claim 1, wherein said programming instructions comprise parameter threshold values.

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26. The system of Claim 1, wherein said network based interface is an HTML interface.

27. The system of Claim 26, wherein said HTML interface comprises an image display area, a monitored parameter display area, an alarm threshold display area, and a system user information display area.

28. The system of Claim 27, wherein said system user information display area can be configured by a user to display customized information.

29. The system of Claim 1, further comprising a rechargeable backup battery to provide power upon loss of said power source.

30. The system of Claim 1, wherein said power source is a 5 volt DC power source.

31. The system of Claim 1, further comprising a video imager to provide a digital image of the space or its contents.

32. The system of Claim 31, wherein said video imager is a CMOS imager.

33. The system of Claim 31, wherein the system is mounted internal to a component rack for monitoring of individual components.

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34. The system of Claim 31, further comprising a binary input to activate said video imager to capture a current image of the monitored space.

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35. The system of Claim 34, further comprising an external sensor, wherein said external sensor provides said binary input upon the occurrence of a preset condition.

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36. The system of Claim 35, wherein said external sensor is a magnetic switch for sensing the opening of a door to said space, and wherein said preset condition is the opening of said door.

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37. The system of Claim 1, further comprising instructions for software agents operable to investigate the internal condition of network components.

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38. The system of Claim 37, wherein said software agents investigate the internal condition of compatible network components through SNMP, DMI, and SMBIOS interfaces.

39. The system of Claim 1, further comprising one or more binary outputs connected to one or more relays to control one or more external loads, and instructions for controlling said outputs.

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40. The system of Claim 39, wherein controlling comprises turning an external load on or off, and wherein the external load is an air conditioning unit.

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41. The system of Claim 1, wherein said instructions for processing can be updated via the network based interface.

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42. The system of Claim 1, further comprising a smoke alarm sensor for generating an alarm signal upon detecting an audible smoke alarm.

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43. The system of Claim 1, further comprising a 64-bit encoder chip to provide encryption and password protection for said network based interface configurable by a user.

44. A system for monitoring a space and its contents over a network, comprising:

a microprocessor to provide processing and network connectivity capability;

5 a video imager to generate a digital image of the space or its contents;

instructions for processing said digital image and forwarding said digital image to the network;

10 at least one input/output port for communicating with the network;

one or more memory modules for storing system data;

a network based interface for providing programming instructions to the microprocessor and for
15 receiving information from the system; and

a power source to power the system.

45. The system of Claim 44, wherein the network is a global computer network.

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46. The system of Claim 45, wherein the global computer network is the Internet.

47. The system of Claim 44, wherein the network
25 is an intranet.

48. The system of Claim 44, further comprising one or more connectors to interface with external devices.

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49. The system of Claim 48, wherein the one or more connectors further comprise no more than one of each of an Ethernet connector, a serial connector, a power connector, and a phone line connector.

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50. The system of Claim 48, wherein the Ethernet connector is an RJ-45 to Cat 5 or Cat 3 wiring connector.

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51. The system of Claim 49, wherein said power source is the excess voltage provided by an Ethernet cable coupled to said Ethernet connector.

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52. The system of Claim 44, wherein the network connectivity capability is via a telephone line.

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53. The system of Claim 44, wherein the network connectivity capability is via an Ethernet interface, and wherein said Ethernet interface has compliant TCP/IP stacks.

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54. The system of Claim 44, wherein the microprocessor is an embedded Java microprocessor.

55. The system of Claim 54, wherein the microprocessor is a tiny internet interface microprocessor.

56. The system of Claim 54, wherein the microprocessor operates on an embedded Java software platform.

57. A system for monitoring a space and its contents over a network, comprising:

a microprocessor to provide processing and network connectivity capability;

5 instructions for software agents operable to investigate the internal condition of network components and generate one or more component status signals;

10 instructions for processing said status signals and generating an alarm signal when any of the one or more component status signals exceeds a corresponding threshold value;

at least one input/output port for communicating with the network;

15 one or more memory modules for storing system data;

a network based interface for providing programming instructions to the microprocessor and for receiving information from the system; and

20 a power source to power the system.

58. The system of Claim 57, wherein said software agents investigate the internal condition of compatible network components through SNMP, DMI, and SMBIOS
25 interfaces.

59. A method for monitoring a space and its contents over a network with an integrated network server, comprising the steps of:

providing processing and network connectivity capability with a microprocessor;

at one or more sensors, detecting one or more physical parameters;

generating at said sensors one or more sensor signals representative of the detected physical parameters;

converting one or more of the sensor signals to a digital format at an analog-to-digital converter and forwarding one or more corresponding digital signals to the microprocessor;

processing said sensor signals to generate an alarm signal when any of the one or more physical parameters exceeds a corresponding threshold value;

communicating monitoring data with the network through at least one input/output port;

providing programming instructions to the microprocessor through a network-based interface; and transmitting space and content status information to a user.

60. The method of Claim 59, wherein the network is a global computer network.

61. The method of Claim 60, wherein the global computer network is the Internet.

62. The method of Claim 59, wherein the network is an intranet.

5 63. The method of Claim 59, further comprising the step of interfacing with one or more external devices with through one or more connectors.

10 64. The method of Claim 63, wherein the one or more connectors further comprise no more than one of each of an Ethernet connector, a serial connector, a power connector, and a phone line connector.

15 65. The method of Claim 64, wherein the Ethernet connector is an RJ-45 to Cat 5 or Cat 3 wiring connector, and wherein the serial connector is an RJ-11 connector.

20 66. The method of Claim 65, further comprising the step of powering said network server with the excess voltage provided by an Ethernet cable coupled to said Ethernet connector.

25 67. The method of Claim 59, wherein the network connectivity capability is via a telephone line.

68. The method of Claim 59, wherein the network connectivity capability is via an Ethernet interface, and wherein said Ethernet interface has compliant TCP/IP stacks.

69. The method of Claim 59, wherein the
microprocessor is an embedded Java microprocessor.

5 70. The method of Claim 69, wherein the
microprocessor is a tiny internet interface
microprocessor.

10 71. The method of Claim 69, wherein the
microprocessor operates on an embedded Java software
platform.

15 72. The method of Claim 59, further comprising
the step of generating and forwarding an email status
report to one or more users through said network-based
interface.

20 73. The method of Claim 72, wherein the status
report indicates that one or more of the one or more
physical parameters has exceeded said corresponding
threshold value.

25 74. The method of Claim 59, further comprising
the steps of generating and forwarding an email alarm
report to one or more users when any one of the one or
more physical parameters exceeds said corresponding
threshold value.

30 75. The method of Claim 59, further comprising
the steps of generating and forwarding a status report
via electronic paging.

76. The method of Claim 59, wherein said programming instructions are provided in HTML.

5 77. The method of Claim 59, wherein said programming instructions comprise parameter threshold values.

10 78. The method of Claim 59, wherein said network-based interface is an HTML interface.

15 79. The method of Claim 78, wherein said HTML interface comprises an image display area, a monitored parameter display area, an alarm threshold display area, and a system user information display area.

20 80. The method of Claim 79, wherein said system user information display area can be configured by a user to display customized information.

 81. The method of Claim 59, further comprising the steps of generating a digital image of the space or its contents with a video imager.

25 82. The method of Claim 81, wherein said video imager is a CMOS imager.

30 83. The method of Claim 81, wherein the network server is mounted internal to a component rack for monitoring of individual components.

5 84. The method of Claim 81, further comprising
the step of activating said video imager to capture a
current image of the monitored space using a binary
input.

10 85. The method of Claim 84, further comprising
the step of generating said binary input at an external
sensor upon the occurrence of a preset condition.

 86. The method of Claim 59, further comprising
the step of investigating the internal condition of
network components using software agents.

15 87. The method of Claim 86, wherein said software
agents investigate the internal condition of compatible
network components through SNMP, DMI, and SMBIOS
interfaces.

20 88. The method of Claim 59, further comprising
the step of controlling one or more external loads
using one or more binary outputs connected to one or
more relays.

25 89. The method of Claim 88, wherein the step of
controlling comprises turning an external load on or
off.

90. The method of Claim 59, further comprising the step of updating said instructions for processing via the network-based interface.

5 91. The method of Claim 59, further comprising the step of generating an alarm signal using a smoke alarm sensor upon detecting an audible smoke alarm.

10 92. The method of Claim 59, further comprising the step of providing user configurable encryption and password protection for said network-based interface using a 64-bit encoder chip.